

WHAT IS CLAIMED:

1. A tool assembly for a surgical stapling device, comprising:

a channel member for supporting a staple cartridge therein, said staple cartridge carrying a plurality of staples;

an anvil dimensioned to deform said plurality of staples ejected from said staple cartridge thereagainst;

a sled movable through said staple cartridge from a first position to a subsequent position which operatively forces said plurality of staples from said staple cartridge through tissue and against said anvil to staple tissue disposed between said anvil and said staple cartridge;

a dynamic clamping member movable with said sled through said channel member and said anvil, said dynamic clamping member having a first mechanical interface which slidably engages said anvil and a second mechanical interface which slidably engages said channel assembly, said first and second mechanical interfaces of said dynamic clamping member being in substantial vertical registration relative to one another to oppose the expansive forces associated with clamping and stapling tissue and to maintain a substantially uniform gap between tissue contacting surfaces of said anvil and said staple cartridge during stapling.

2. A tool assembly according to claim 1 wherein said first mechanical interface of said dynamic clamping member includes a pin which translates within a corresponding slot disposed within the interior of said anvil upon movement of said sled.

3. A tool assembly according to any preceding claim wherein said slot disposed within the interior of said anvil includes a generally T-shaped cross section.

4. A tool assembly according to any preceding claim wherein said second mechanical interface of said dynamic clamping member includes a flange which secures said dynamic clamping member for translation within a corresponding slot disposed within said channel assembly upon movement of said sled.

5. A tool assembly according to any preceding claim wherein said first mechanical interface of said dynamic clamping member includes a pin which translates within a corresponding slot disposed within said anvil upon movement of said sled, and said second mechanical interface of said dynamic clamping member includes a flange which secures said dynamic clamping member within a corresponding slot disposed within said channel assembly, said pin and said flange relatively positioned on said dynamic clamping member to oppose the forces associated with the compression and movement of fluid within tissue during clamping and with the sled during the forcing of said plurality of staples against said anvil to staple tissue disposed therebetween.

6. A tool assembly according to any preceding claim wherein said tool assembly includes a selectively movable clamping collar which biases against a cam surface on said anvil to close said anvil relative to said staple cartridge and clamp tissue therebetween.

7. A tool assembly according to any preceding claim wherein said sled includes at least one angled surface which upon movement thereof forces said staples from said staple cartridge through tissue and against said anvil to deform and close the staples about tissue.

8. A tool assembly according to any preceding claim wherein said tool assembly is part of a disposable loading unit for removable attachment to a distal end of said shaft of a surgical stapler.

9. An articulating assembly for a surgical stapling device, comprising:
an elongated shaft having proximal and distal ends and a longitudinal "X" axis defined therethrough, said shaft being rotatable about said longitudinal "X" axis;

a tool assembly which attaches to the distal end of the shaft, said tool assembly including:

a tubular connector which mounts a pivot block which allows pivotable movement of said tool assembly about a "Y" axis and a "Z" defined perpendicular to said "X" axis;

an anvil having a bottom surface;

a channel assembly being configured to support a staple cartridge therein, said staple cartridge including a plurality of staples therein and an upper surface which opposes said bottom surface of said anvil;

a sled having at least one angled surface thereon, said sled being movable along said staple cartridge such that said at least one angled surface of said sled forces said plurality of staples to deform against said bottom surface of said anvil; and

a dynamic clamping member which moves with said sled to subsequently sever tissue after deformation of said staples.

10. An articulating assembly for a surgical stapling device according to claim 9 wherein rotation of said shaft about said longitudinal "X" axis correspondingly rotates said tool assembly about said longitudinal "X" axis.

11. An articulating assembly for a surgical stapling device according to claim 9 or 10 wherein said tool assembly includes a selectively movable clamping collar which biases against a cam surface on said anvil to close said anvil relative to said staple cartridge to clamp tissue therebetween.

12. An articulating assembly for a surgical stapling device according to claim 9, 10 or 11 wherein said dynamic clamping member further comprises a first mechanical interface which translates within a corresponding slot disposed within said anvil upon movement of said sled and a second mechanical interface which translates within a corresponding slot disposed within said channel assembly upon movement of said sled.

13. An articulating assembly for a surgical stapling device according to claim 9, 10 or 11 wherein said first and second mechanical interfaces of said dynamic clamping member reside in substantial vertical registration relative to one another.

14. An articulating assembly for a surgical stapling device according to claim 9, 10, 11, 12 or 13 wherein said first mechanical interface and said second mechanical interface are substantially vertically positioned and

dimensioned relative to one another to oppose the forces associated with compression and movement of fluid within tissue during clamping and with deforming said plurality of staples against said anvil to staple tissue disposed therebetween.

15. A tool assembly for a surgical stapling device, comprising:

- an anvil having a bottom surface and a longitudinally disposed slot defined therethrough;

- a channel assembly having a longitudinally disposed slot defined therethrough;

- a staple cartridge which mechanically mounts to said channel assembly, said staple cartridge including a plurality of staples disposed therein and an upper tissue contacting surface;

- a sled being selectively movable along the staple cartridge to effect ejection of said plurality of staples from said cartridge to deform against said bottom surface of said anvil;

- a dynamic clamping member which includes:

- a bottom flange; and

- an extension that extends upwardly from said bottom flange, said extension including an aperture defined therethrough for receiving a pin therein, said pin when in said aperture disposed substantially vertically from said bottom flange and being configured to ride along said slot defined within said anvil, said extension and bottom flange being mounted to said sled and through said slot defined within said channel assembly such that movement of said sled moves said dynamic clamping member through said staple cartridge to sever tissue clamped and stapled between said anvil bottom surface and said tissue contacting surface of said cartridge.

a leading cutting edge at a distal end thereof for severing tissue

16. A tool assembly for a surgical stapling device according to claim 15 wherein during movement of said clamp assembly, said pin and said bottom flange of said dynamic clamping member cooperate to further proximate said bottom surface of said anvil and said upper surface of said staple cartridge to squeeze fluid from tissue disposed therebetween and to oppose the normal forces associated with stapling tissue and maintain a substantially uniform gap between said anvil and said staple cartridge during stapling.

17. A tool assembly for a surgical stapling device according to claim 14, 15 or 16 wherein said tool assembly includes a selectively movable pre-clamping collar disposed proximally of said dynamic clamping collar and which biases against a cam surface on said anvil to close said anvil relative to said staple cartridge to approximate and grasp tissue therebetween.

18. A tool assembly for a surgical stapling device according to claim 14, 15, 16 or 17 wherein during movement of said clamp assembly, said pin, said leading edge and said bottom flange remain in substantial vertical registration relative to one another.

19. A tool assembly for a surgical stapling device, comprising:
a channel member for supporting a staple cartridge therein,
said staple cartridge carrying a plurality of staples;

an anvil dimensioned to deform said plurality of staples ejected from said staple cartridge thereagainst;

a sled movable from a first position to a subsequent position which forces said plurality of staples from said staple cartridge through tissue and against said anvil to staple tissue disposed between said anvil and said staple cartridge, said sled including a cavity defined therein;

a dynamic clamping member movable with said sled through said channel member and said anvil, said dynamic clamping member being dimensioned to securely engage within said cavity of said sled, said dynamic clamping member including a first mechanical interface which slidably engages said anvil and a second mechanical interface which slidably engages said channel assembly, said first and second mechanical interfaces of said dynamic clamping member being arranged to oppose the expansive forces associated with clamping and stapling tissue and to maintain a substantially uniform gap between said anvil and said staple cartridge during stapling.

20. A tool assembly for a surgical stapling device according to claim 19 wherein said sled includes a spacer having a trailing edge and a proximal flange having an upwardly extending proximal edge and a downwardly depending distal edge, said trailing edge of said sled, said upwardly extending proximal edge of said flange and said downwardly depending distal edge of said flange cooperating to secure said dynamic clamping member within said sled.